

# **Record of Decision**

## **Dump Site Near Bldg. 293**

**NCTAMSPAC, WAHIAWA, OAHU, HAWAII**

**September 2006**

**Department of the Navy  
Naval Facilities Engineering Command, Hawaii  
400 Marshall Road  
Pearl Harbor, HI 96860-3139**



**Comprehensive Long-Term Environmental Action Navy  
Contract Number N62742-03-D-1837, CTO 0008**



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**Prepared for:**



**Department of the Navy  
Naval Facilities Engineering Command, Hawaii  
400 Marshall Road  
Pearl Harbor, HI 96860-3139**

**Prepared by:**

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**Prepared under:**

**Comprehensive Long-Term Environmental Action Navy  
Contract Number N62742-03-D-1837, CTO 0008**



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## ACRONYMS AND ABBREVIATIONS

µg/kg	microgram per kilogram
bgs	below ground surface
Bldg.	Building
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	chemical of potential concern
CSM	conceptual site model
DOH	Department of Health, State of Hawaii
DRO	diesel range organics
EPA	Environmental Protection Agency, United States
EPC	exposure point concentration
gpd	gallons per day
GRO	gasoline range organics
HQ	hazard quotient
mg/kg	milligram per kilogram
NAVFAC Hawaii	Naval Facilities Engineering Command, Hawaii
NCTAMSPAC	Naval Computer and Telecommunications Area Master Station, Pacific
OWLF	Old Wahiawa Landfill
PCB	polychlorinated biphenyl
PRG	preliminary remediation goal
RAB	Restoration Advisory Board
RBS	risk-based screening
RI	remedial investigation
ROD	record of decision
SRA	screening risk assessment
SSRBE	site-specific risk-based evaluation
SVOC	semivolatile organic compound
TPH	total petroleum hydrocarbons
VOC	volatile organic compound



## **1. Declaration**

### **1.1 SITE NAME AND LOCATION**

The Dump Site Near Building (Bldg.) 293, Naval Computer and Telecommunications Area Master Station, Pacific (NCTAMSPAC), Wahiawa, Oahu, Hawaii (United States Environmental Protection Agency [EPA] Identification: HI0170090054, occupies about 2.9 acres within NCTAMSPAC. NCTAMSPAC was added to the National Priorities List on 31 May 1994.

### **1.2 STATEMENT OF BASIS AND PURPOSE**

Investigation results for the Dump Site Near Bldg. 293 (Site), indicate that concentrations of chemicals of potential concern (COPCs) at the site are below levels that could threaten human health or the environment.

Therefore, the Navy, in conjunction with the State of Hawaii Department of Health (DOH) and EPA Region 9, selected no action as the final remedy for the Site. The final remedy was selected in accordance with the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA), after comparing COPC concentrations detected in soil to risk-based screening criteria including EPA Region 9 preliminary remediation goals (PRGs). This decision is based on the Administrative Record File for the site.

This record of decision (ROD) satisfies CERCLA, DOH, and EPA Region 9 requirements. DOH and EPA Region 9 concur with the selected remedy.

### **1.3 DESCRIPTION OF THE SELECTED REMEDY**

In 1996, the Navy conducted a remedial investigation. Soil assessment and investigation results indicated that two COPCs, polychlorinated biphenyls (PCBs) and thallium, were detected at concentrations above residential PRGs in soil samples. Human health and ecological risk assessments determined that exposure to the soil does not pose an unacceptable risk to human health or the environment (as described in Section 2), and that the site is suitable for unrestricted use. Therefore, no CERCLA action is necessary for the site. Based on the soil investigation results, the Navy, in conjunction with the DOH and EPA Region 9, selected no action as the final remedy for the Site.

### **1.4 STATUTORY DETERMINATIONS**

Executive Orders 12080 and 12580 authorize the Navy to conduct environmental cleanup and remediation activities at Navy sites; therefore, the Navy is the lead agency for the Site.

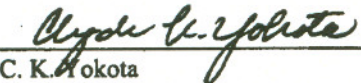
The Navy determined that no action is necessary to ensure protection of human health and the environment at the Site.

Five-year reviews are not required for the Site because the remedy did not result in hazardous substances, pollutants, or contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure.

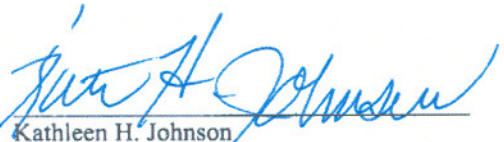
### **1.5 AUTHORIZING SIGNATURES**

The EPA and U.S. Navy jointly select the remedy described in this ROD. The Navy, with concurrence from the DOH and EPA Region 9, has determined that no further action is necessary at

the Dump Site Near Bldg. 293 because the site does not pose a threat to human health or the environment.

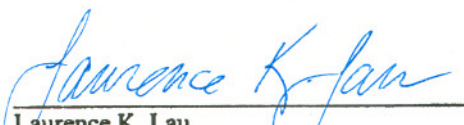
  
C. K. Yokota  
Director, Regional Environmental Department  
By direction of: Commander, Navy Region Hawaii

9/27/06  
Date

  
Kathleen H. Johnson  
Chief, Federal Facilities and Site Cleanup Branch  
Superfund Division, U.S. EPA Region 9

9/28/06  
Date

The State of Hawaii Department of Health concurs with the selected remedy as documented in this ROD.

  
Laurence K. Lau  
Deputy Director of Environmental Health  
State of Hawaii Department of Health

9/28/06  
Date

## **2. Decision Summary**

### **2.1 SITE NAME, LOCATION, AND DESCRIPTION**

As shown on Figure 1 (all figures are located at the end of the document), the Dump Site Near Bldg. 293 is located in NCTAMSPAC Wahiawa, Oahu, Hawaii. As shown on Figure 2, the Site occupies about 2.9 acres in a gulch next to the concrete foundation of Bldg. 293, the former Auto Hobby Shop, approximately 0.13 miles north of Whitmore Avenue. Existing and former warehouse building locations and parcel boundaries at the Site are also shown on Figure 2.

The Navy is the lead agency for environmental cleanup at the Site. Supporting agencies include the DOH and EPA Region 9. Environmental investigations conducted at the Site have been funded through the Navy's Installation Restoration Program.

### **2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES**

This section summarizes available historical information regarding the use of the Site and describes previous site investigations.

#### **2.2.1 Navy Activities at the Dump Site Near Bldg. 293**

Prior to the 1996 site reconnaissance visit conducted for the Remedial Investigation (RI), the site had not been identified as an environmental concern. Former activities at the Site are not definitively known but, based on visual evidence, are thought to include the disposal of wastes generated at the former Auto Hobby Shop. Maintenance activities in the Auto Hobby Shop often created waste or debris that might have contained hazardous materials such as solvents, paint, fuels, or lubricants. The waste and debris from those activities appear to have been disposed of by uncontrolled dumping into the adjacent gulch.

#### **2.2.2 Current Site Use**

There are no activities currently at the Site. Current site conditions are shown on Figure 3.

#### **2.2.3 Previous Site Investigations**

The investigation documented in the *Final Remedial Investigation Report, Old Wahiawa Landfill Building 6 Disposal Area, Old Incinerator Site, & Dump Site Near Building 293* (Earth Tech 2006) was performed to identify the nature and extent of contamination, quantify the risk, and, if necessary, identify appropriate remedial actions resulting from Navy activities at the Site. The results confirm that soil at the Site does not threaten human health or the environment.

The human health and ecological risk assessments evaluated risks associated with exposure to the soil and determined whether further action is warranted to protect human and ecological receptors. The human health risk assessment concluded that the risk to human health associated with exposure to Site soils is acceptable. The ecological risk assessment determined that although some wildlife may be adversely affected, the risk is acceptable.

#### **2.2.4 CERCLA Enforcement Activities**

No enforcement activities have been directed at the Site.

## **2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION**

In an effort to involve the public in the decision-making for the Site, the Navy established a Restoration Advisory Board (RAB) composed of community representatives and Navy Installation Restoration Program personnel. The Navy also held public meetings, gave presentations, and issued fact sheets summarizing the site investigation and recommendations. In addition, the Navy established contacts for the public at Naval Facilities Engineering Command, Hawaii (NAVFAC Pacific) and the base.

The Proposed Plan was made available for public comment during a 30-day review period from 14 July through 13 August 2006. In addition, a RAB meeting was conducted on 13 July 2006 to present the Proposed Plan. The review period and RAB meeting provided the local community with opportunities to comment on the cleanup methods and strategy.

Project documents including work plans, technical reports, fact sheets, and other materials relating to the Site activities were placed in the information repository at the following locations:

Wahiawa Public Library  
820 California Avenue  
Wahiawa, Hawaii 96786  
Telephone: (808) 622-6345

Hamilton Library at the University of Hawaii at Manoa  
Hawaiian and Pacific Collection  
2550 McCarthy Mall  
Honolulu, Hawaii 96822  
(808) 956-8264

Additional project information is located in the information repository file located at NAVFAC Pacific in Pearl Harbor. The address for the information repository file is provided below:

Naval Facilities Engineering Command, Pacific  
258 Makalapa Drive, Suite 100  
Attn: NAVFACPAC EV4  
Pearl Harbor, Hawaii 96860-3134

## **2.4 SCOPE AND ROLE OF RESPONSE ACTION**

No further CERCLA action is necessary for the Site, based on the findings of the RI and risk assessment results. None of the concentrations of COPCs detected in soil threaten human or ecological health.

## **2.5 SITE CHARACTERISTICS**

### **2.5.1 Site Description**

The Site is located within NCTAMSPAC Wahiawa, approximately 0.13 miles north of Whitmore Avenue and occupies about 2.9 acres in a gulch next to the concrete foundation of Bldg. 293, the former Auto Hobby Shop.

### 2.5.2 Physical Setting

NCTAMSPAC Wahiawa is located on the Schofield Plateau at approximately 1,300 feet above mean sea level. The plateau, which forms central Oahu between the Koolau and Waianae Ranges, was created when Koolau lava flows overlapped the flanks of the older Waianae Range. Near the facility, the plateau slopes gently westward, corresponding to the dip of the underlying lava beds. A thick layer of surface soil covering most of the facility is dissected by a system of narrow, steep-sided gullies formed by local erosion.

### 2.5.3 Geology

Three stratigraphic units occur at NCTAMSPAC Wahiawa:

- The upper unit is silty clay or clayey silt laterite, a reddish soil formed by extensive weathering of the underlying basalt. In the gullies, the surface soil is silty clay or clayey silt alluvium deposited in the beds of intermittent streams.
- Below the silty clay and laterite is saprolite, 10 to 100 feet thick, formed by partial weathering of the underlying Koolau volcanic rocks. Saprolite is distinguished from soil by its residual basaltic structure and texture, including fractures and vesicles.
- Further down are unweathered to moderately weathered Koolau volcanic rocks (basalt) deposited as lava and tuff flows. These flows crop out near the crest of the Koolau Range. Unweathered Koolau volcanic rocks are highly permeable, jointed, dense to very dense vesicular basalt. The basalt may be locally weathered along joints.

The side slopes of the gulch are saprolite. The flat floor of the gulch is made up of alluvial clayey silt and silty clay derived from erosion of the side slopes and upgradient surface soil.

### 2.5.4 Hydrogeology

Groundwater of the Schofield High-Level Aquifer lies within the fractured basalt of the Koolau Volcanic Series and, possibly, at greater depths within the Waianae Volcanics. Basalt dikes form relatively impermeable barriers in the permeable volcanic rock. The dikes divert groundwater to successively lower compartments, creating step-like breaks in the water table. Groundwater flows generally westward. The aquifer is recharged by infiltration of rainfall in the Koolau Range and by rainwater and streamflow infiltration on the Schofield Plateau (Ogden 1995).

The groundwater beneath NCTAMSPAC Wahiawa exists as a high level, unconfined aquifer contained in dike compartments. According to the state groundwater classification system, the Schofield aquifer is classified as a currently used, irreplaceable source of drinking-quality water, highly vulnerable to contamination (Mink and Lau 1990). The potentiometric surface of the Schofield Aquifer is 800 to 900 feet below ground surface (bgs), based on initial water level measurements in Well Number (No.) 3-3100-02 (approximately 200 feet east of Bldg. 293), which taps the Schofield Aquifer (Figure 4). The 960-foot-deep well has supplied municipal water to NCTAMSPAC Wahiawa since April 1997. This supply well is sampled quarterly by the DOH and has not detected any COPCs attributable to NCTAMSPAC operations.

Perched water occurs locally where less permeable strata impede the downward flow of surface water. The perched water within and around NCTAMSPAC Wahiawa is not identified or classified by the state due to its limited extent. Site-specific evidence of the limited extent of the perched groundwater is provided by observations made at another site within NCTAMSPAC, the Old Wahiawa Landfill (OWLF). Observations were made as soil borings were advanced and during attempts to gauge water levels and collect groundwater samples from monitoring wells. Perched groundwater was not

encountered at some borings and attempts to collect additional groundwater samples were unsuccessful due to dry wells. At the adjacent Bldg. 6 Disposal Area, limited, perched water was encountered at depths of 8 to 10 feet bgs in two borings in the gulch floor alluvium (Earth Tech 2006). This evidence suggests the presence of a spatially limited, and possibly seasonal, perched water table in this area and therefore is not a usable drinking water source.

According to *Guidelines for Ground-Water Classification Under the EPA Ground-Water Protection Strategy* (EPA 1988) groundwater is classified as Class I, II, or III, as follows:

- Class I groundwater is highly vulnerable to contamination and is an irreplaceable source of drinking water for a substantial population, or is ecologically vital.
- Class II groundwater is a current or potential source of drinking water.
- Class III groundwater is not a potential source of drinking water and is of limited beneficial use.

The Schofield aquifer meets the criteria for Class I groundwater. However, the perched groundwater is not likely to meet the criteria for classification as either Class I or Class II groundwater. Under the federal guidelines, a potential source of drinking water (Class I or II) is defined as a groundwater source “capable of yielding a quantity of drinking water to a well or spring sufficient for the needs of an average family.” This yield is established at 150 gallons per day (gpd) or 0.104 gallons per minute sustainable throughout the year. Groundwater is considered suitable for drinking purposes if it has a “total dissolved solids concentration of less than 10,000 milligrams per liter (mg/L), which can be used without treatment, or that can be treated using methods reasonably employed in a public water system” (EPA 1988). Although the available groundwater data indicate that the total dissolved solids concentration of the perched groundwater at the OWLF is less than 10,000 mg/L, the boring and well monitoring well observations indicate that perched groundwater at the OWLF is not capable of yielding 150 gpd sustainable throughout the year (Earth Tech 2006.)

### **2.5.5 Conceptual Site Model**

This conceptual site model (CSM) identifies land and groundwater use scenarios and potential exposure pathways for site-specific current and future land users and ecological receptors. Figure 5 and Figure 6 are flow charts of the CSM and represent the land and water use scenarios and how they may affect human and ecological receptors. Figure 7 shows the surrounding land use and locations of residential areas.

## **2.6 CURRENT AND POTENTIAL FUTURE LAND USE**

### **2.6.1 Current and Future Onsite and Surrounding Area Land Use**

Currently there are no activities at the Site. Figure 7 shows land use in and around NCTAMSPAC Wahiawa. The Site is adjacent to commercial and industrial land within NCTAMSPAC Wahiawa. The rugged, heavily vegetated land northeast, east, and southeast of the facility is within a Conservation Land Use District. The plateau to the south and north is primarily an Agricultural Land Use District devoted to pineapple cultivation. Land beyond the facility boundary is designated for military use, agriculture, or preservation and is occasionally used for recreation by base personnel. There are no future plans to develop land at the Dump Site Near Bldg. 293 due to

- hazards from an intermittent stream that runs through the site (Figure 4)
- soil erosion from runoff and
- location of the site (in gulch)

## 2.7 SUMMARY OF SITE RISKS

### 2.7.1.1 POTENTIAL CONTAMINANT TRANSPORT AND EXPOSURE PATHWAYS

An exposure pathway consists of the following elements:

- A chemical source and mechanism for chemical release
- A retention or transport mechanism
- A point of potential contact with the contaminated medium (i.e., exposure point)
- An exposure route at the exposure point

The collective geologic and hydrogeologic data indicate that the groundwater transport pathway to the basal aquifer at the Site is incomplete, and any transport that may occur would be insignificant and insufficient to impact human health or the environment. This is corroborated by the fact that no COPCs have been detected in the basal aquifer supply well at NCTAMSPAC.

### 2.7.1.2 CONTAMINANT TRANSPORT TO A RECEPTOR

Ingestion of chemicals in soil and groundwater, dermal contact with chemicals, and inhalation of volatile organic compounds (VOCs) in air and groundwater are the exposure pathways evaluated in the CSM for the Site. The CSM identified the following receptors:

- Current offsite residents
- Current onsite trespassers (adult and juvenile)
- Future commercial workers
- Future construction workers
- Future residents or industrial onsite workers (adult and juvenile)
- Ecological receptors

### 2.7.2 Human Health Screening Risk Assessment

The human health screening risk assessment (SRA) is the first of three tiers defined by Navy policy for conducting human health risk assessments (DON 2001). The Tier 1 SRA consists of two parts: (1) Tier 1A, the risk-based screening (RBS), in which default residential and industrial exposure assumptions are evaluated under a reasonable maximum exposure scenario and a central tendency exposure scenario, and (2) Tier 1B, a site-specific risk-based evaluation (SSRBE) that evaluates potential reuse scenarios and included trespassers and commercial workers.

The RBS first entailed a comparison of site exposure point concentrations (EPCs) to residential PRGs for relevant exposure pathways. EPCs were the lower value of the maximum detected concentration or the 95 percent upper confidence limit of the mean concentration. The ratio of EPCs to PRGs provides a method of calculating chemical-specific risks. Chemical-specific risks were summed to derive estimates of cancer risk and non-cancer hazard for each site. Those chemicals with a maximum detected concentration above the residential PRG were retained for further evaluation in the SSRBE.

The soil samples were analyzed for the following:

- volatile organic compounds (VOCs)
- semivolatile organic compounds (SVOCs)

- total petroleum hydrocarbons-gasoline range organics (TPH-GRO) and –diesel range organics (TPH-DRO)
- Pesticides
- PCBs (Aroclors)
- chlorinated herbicides
- organophosphorus pesticides
- carbamate/urea pesticides
- metals
- cyanide

Aluminum, arsenic, chromium, iron, manganese, thallium and vanadium were detected at concentrations exceeding residential or industrial PRGs but only thallium was detected above its respective background range. Thallium was detected at 5.3 milligrams per kilogram (mg/kg), which is above the estimated background range of 4.8 mg/kg and the residential PRG of 5.2 mg/kg. PCBs were detected at concentrations that exceeded residential PRGs; however, PCBs were not detected at concentrations above the 1 mg/kg Toxic Substances Control Act action level.

*Carcinogenic Risk.* Site-related cancer risks that exclude any contribution from background were at or below the  $10^{-6}$  point of departure. The residential scenario showed an estimated incremental cancer risk of  $1 \times 10^{-6}$ . Results from the SSRBE also indicate that exposure to the soil does not pose an unacceptable risk to future users of the site. Therefore, the site is suitable for unrestricted use.

*Noncarcinogenic Hazard.* The cumulative non-cancer hazard index associated with exposure to the EPC was less than the point of departure of 1 for the residential scenario, when background contributions were eliminated. Therefore, exposure to the soil does not pose an unacceptable risk to human health and the site is suitable for unrestricted use.

Cancer risk and non-cancer hazard estimates of exposure to surface and subsurface soil at the Dump Site Near Bldg. 293 were at or below target levels when contributions from background concentrations were removed from the assessment.

### **2.7.3 Ecological Risk Assessment**

The Step 1 and 2 ecological SRA evaluated risks potentially attributable to chemicals detected in soil at the Site. The SRA is intended to comply with the EPA guidance for Steps 1 and 2 of the 8-step *Ecological Risk Assessment Guidance for Superfund* (EPA 1997) and Tier 1 of the *Navy Policy for Conducting Ecological Risk Assessment* (DON 1999).

The results of the SRA demonstrated that concentrations of eight metals (chromium, copper, lead, mercury, nickel, selenium, vanadium, and zinc) detected in soils at the Site exceeded conservative ecological soil benchmark concentrations. This indicated a potential for adverse effects to terrestrial ecological receptors. The chemicals that failed the screening were considered further in Step 3a of a Tier 2 Baseline Ecological Risk Assessment for each site.

Comparison to background concentration ranges for Site soils showed that mercury and zinc are likely present at concentrations above background. The hazard quotients (HQ) for these two metals are derived from no-observed-adverse-effect levels and are all less than 10. The low no-effect HQs suggest that chemicals in surface soil at the Site do not present an unacceptable risk of adverse

effects to bird or mammal populations and need not be considered further for ecological risk, although some individuals may be adversely affected.

#### **2.7.4 Summary of Current Site Risks**

The investigation and risk assessment results presented above indicate that no unacceptable risks to human health, natural resources, or the environment have resulted from Navy activities at the Site. No chemicals were detected at concentrations above risk-based levels of concern. As noted above, groundwater beneath the Site has not been impacted and is not likely to be impacted by chemicals released as a result of Navy activities at the site.

#### **2.8 DOCUMENTATION OF SIGNIFICANT CHANGES**

No significant changes have been documented at the Site.

### **3. Responsiveness Summary**

The 30-day comment period for the Proposed Plan (DON 2006) was held from 28 June through 26 July 2006, as announced in a Notice of Availability that was published in the Honolulu Star-Bulletin on 25 June 2006. A public meeting to discuss the Proposed Plan was held at the Wahiawa Public Library on 13 July 2006. No public comments to the ROD were received during the 30-day comment period or in the public meeting. Comments were received from EPA and DOH and responded to within this document. Responses to comments are included in Attachment A. The batteries that were found in the gulch during the field effort were identified as a concern by EPA. These batteries have since been removed from the gulch.

### **4. References**

- Department of the Navy (DON). 1999. *Navy Policy for Conducting Ecological Risk Assessments*. Letter from A. A. Granuzzo, Chief of Naval Operations, to Commander, Naval Facilities Engineering Command. Ser. N453E/9U595355. Washington. 5 April.
- . 2001. *Department of the Navy Installation Restoration Manual. 2001 Update*. Draft. Alexandria, VA: Naval Facilities Engineering Command. August.
- . 2006. *Proposed Plan, Dump Site Near Bldg. 293, NCTAMSPAC, Wahiawa, Oahu, Hawaii*. Pearl Harbor, HI: Pacific Division, Naval Facilities Engineering Command. May.
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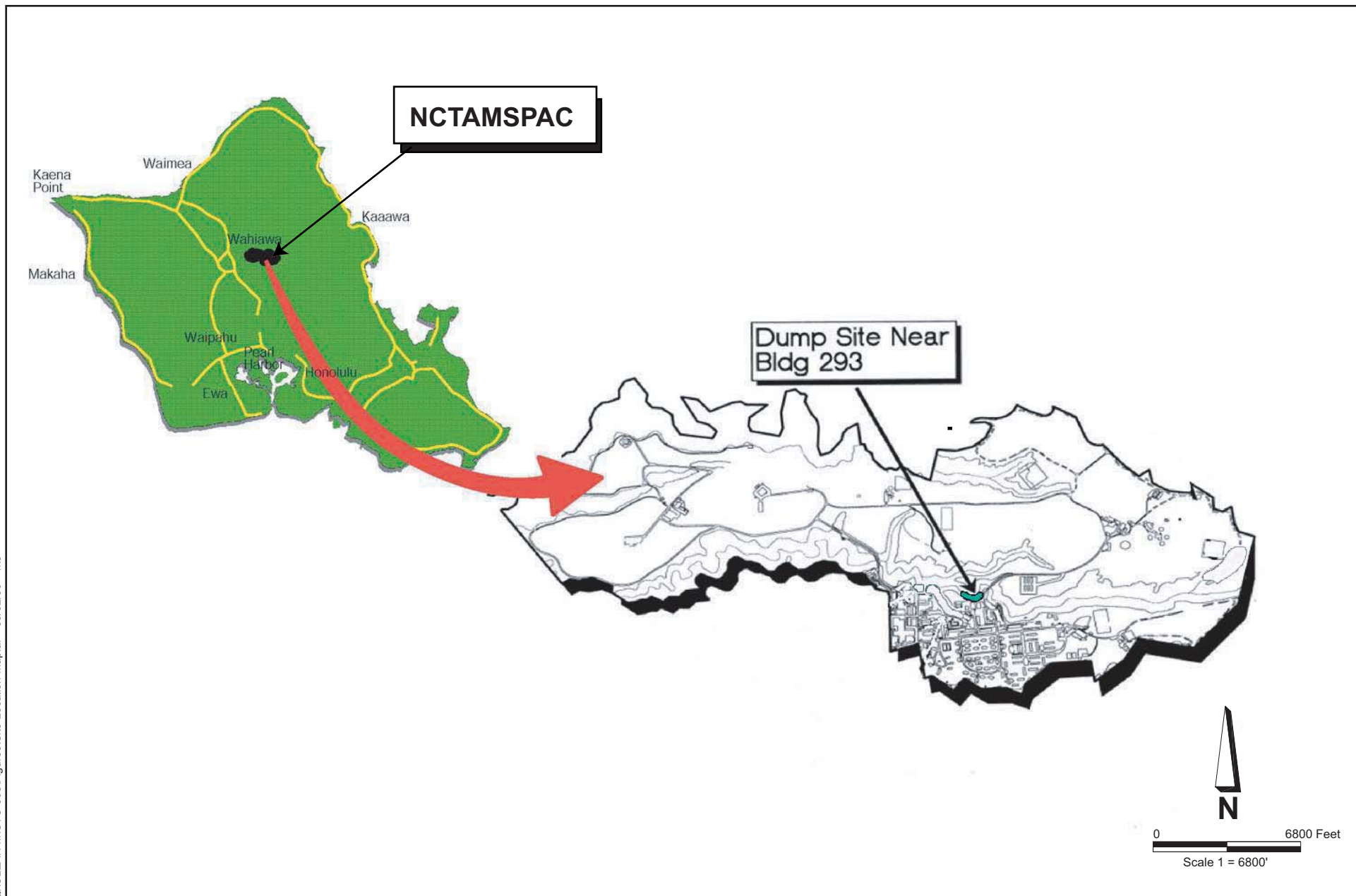
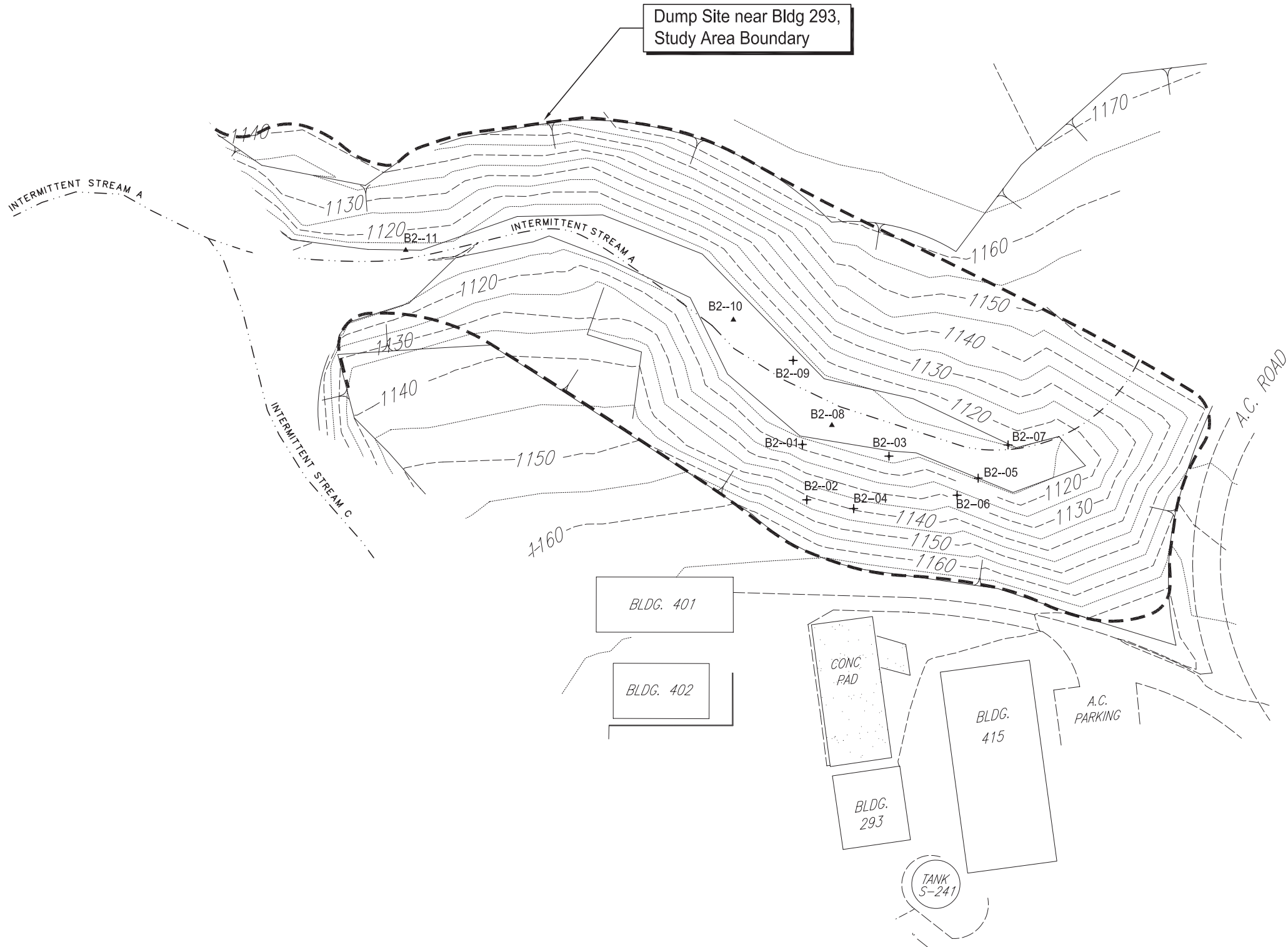


Figure 1  
Site Location Map  
Dump Site Near Bldg. 293  
NCTAMSPAC, Oahu, Hawaii



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### LEGEND

- |           |  |
|-----------|--|
| B2- ##    | Dump Site Near Bldg 293 Sample Location ID |
| -----     | Intermittent Stream                        |
| ^         | Top of Gulch                               |
| - - - - - | Contour Interval (feet above msl)          |
| ▲         | Surface Soil Sample Location               |
| +         | Subsurface/Surface Soil Sample Location    |

### NOTES

1. Surface soil samples were also collected from hand-auger sample locations.
2. Soil samples for geotechnical analysis were collected from soil boring B2-03.



### KEY PLAN

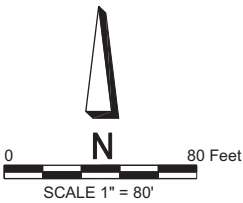


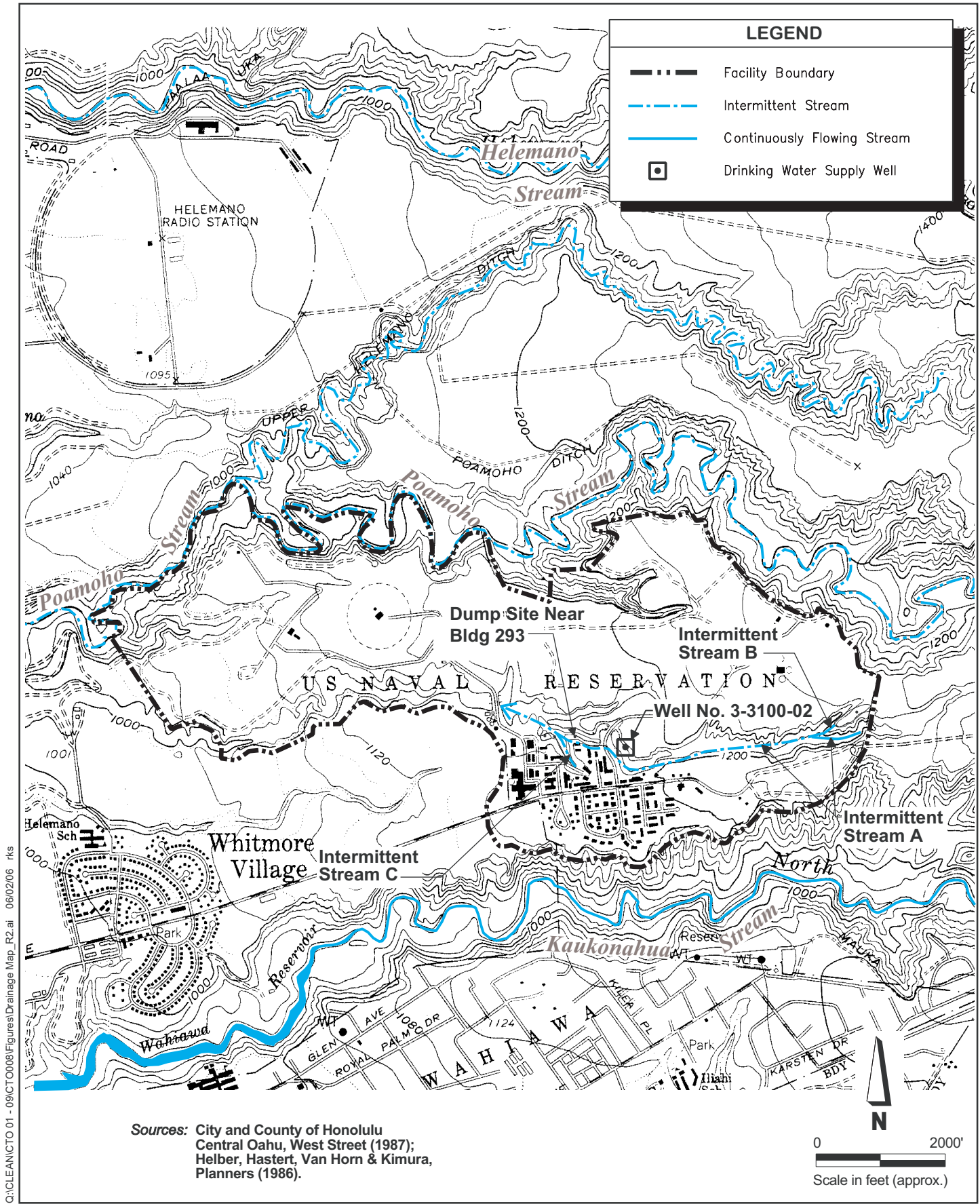
Figure 2  
Site Layout Map  
Dump Site Near Bldg. 293  
NCTAMSPAC, Oahu, Hawaii





**Figure 3**  
**Current Site Conditions**  
**Dump Site Near Bldg. 293**  
**NCTAMSPAC, Oahu, Hawaii**





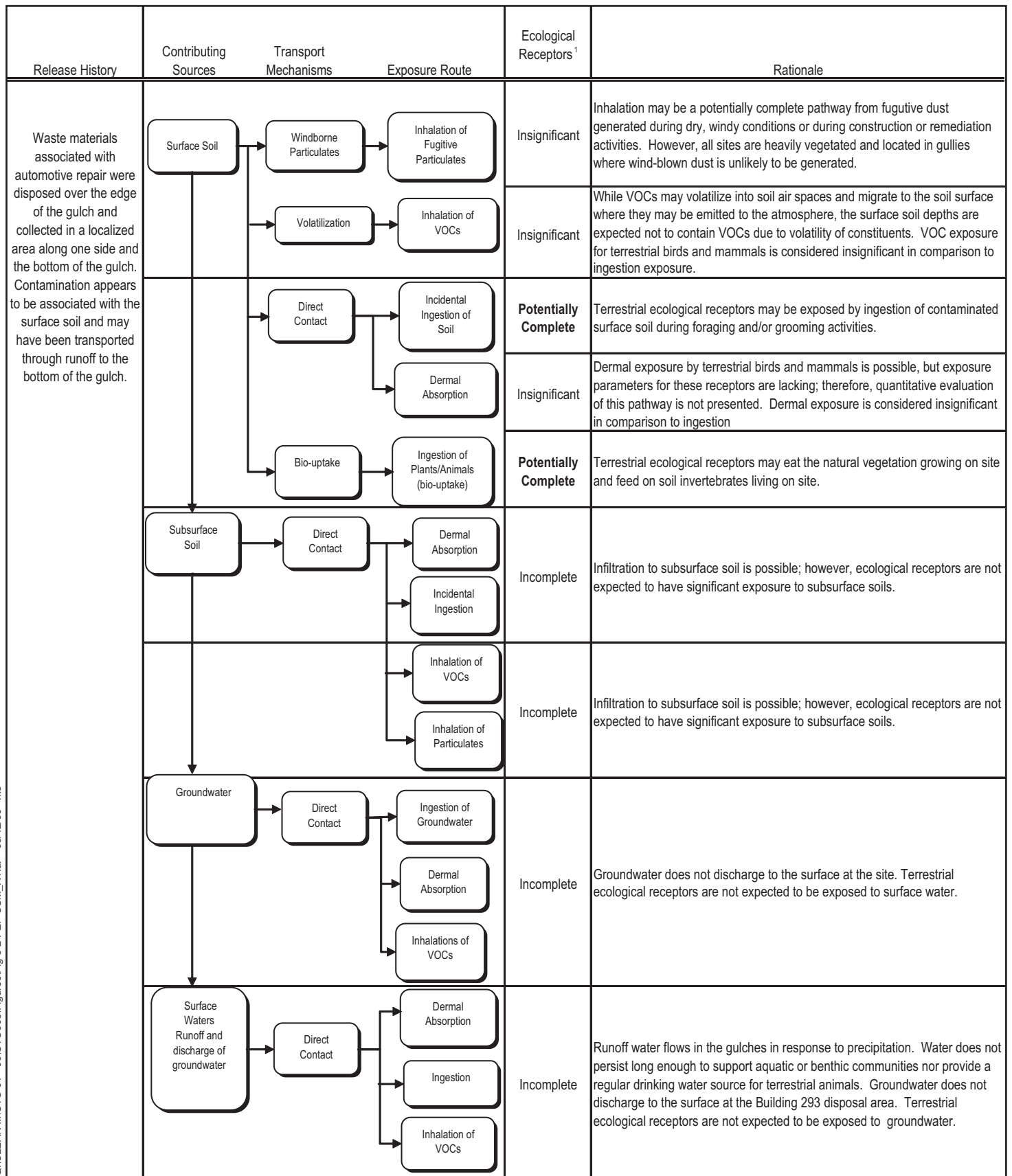


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			Receptors				
			Current Use		Future Use		
			Woodland Trespasser (Adult/Child)	Off-site Resident	Commercial Workers	Residents or Industrial Onsite Workers (Adult/Child)	
Contaminant Source	Transport Mechanism	Exposure Route					Rationale
Surface Soil	Direct Contact	Direct Contact	Insignificant	Insignificant	Insignificant	Insignificant	Direct contact with surface soil is insignificant for future residents, future onsite workers, woodland trespassers, and ecological receptors due to the low detections of constituents at the site.
		Incidental Ingestion	Insignificant	Insignificant	Insignificant	Insignificant	
	Air Transport	Inhalation of Particulates	Insignificant	Insignificant	Insignificant	Insignificant	Air transport of nonvolatile chemicals of potential concern in dust by air is considered to be insignificant for the woodland trespasser and commercial worker due to dense vegetation and high rainfall. Air transport of VOCs is considered insignificant because of their infrequent detection and low concentration in surface and subsurface soil. Inhalation of particulates and VOCs for off-site residents is considered insignificant because the concentrations offsite would be negligible due to the distance. Inhalation of particulates and VOCs is an insignificant exposure pathway for future onsite residents and industrial workers due to the low detections of constituents at the site.
		Inhalation of VOCs	Insignificant	Insignificant	Insignificant	Insignificant	
	Surface Water	Dermal Adsorption	Insignificant	Insignificant	Insignificant	Insignificant	No permanent surface water exists at the site. However, following rainfall, there is a potential for water to accumulate in holes and ditches. Dermal adsorption and incidental ingestion of surface water run-off is insignificant for all current and future receptors due to the low detections of constituents at the site.
		Incidental Ingestion	Insignificant	Insignificant	Insignificant	Insignificant	
		Bio-Accumulation/ Consumption of Fish and Vegetables	Incomplete	Incomplete	Incomplete	Incomplete	
Subsurface Soil	Direct Contact	Dermal Adsorption	Incomplete	Incomplete	Incomplete	Insignificant	Because woodland trespassers and commercial workers are unlikely to engage in activities that would expose subsurface soil, the subsurface soil is considered incomplete for woodland trespassers and commercial workers. Direct contact with, and incidental ingestion of, subsurface soil is insignificant for future onsite workers, future residents engaged in landscaping or construction activities due to the low detections of constituents at the site.
		Incidental Ingestion	Incomplete	Incomplete	Incomplete	Insignificant	
	Unsaturated/ Saturated Zone Transport to Groundwater	Dermal Adsorption	Incomplete	Incomplete	Incomplete	Incomplete	The principal aquifer at NCTAMS PAC is 800-900 feet bgs. Because of the depth of the principal aquifer, the low to moderate permeability of the intervening soil and rock, and the low concentrations of constituents detected in the perched aquifer below the nearby OWLF, the groundwater pathway is considered incomplete.
		Incidental Ingestion	Incomplete	Incomplete	Incomplete	Incomplete	
		Inhalation of VOCs	Incomplete	Incomplete	Incomplete	Incomplete	
		Drinking Water	Incomplete	Incomplete	Incomplete	Incomplete	

**Figure 5**  
**Human Receptor Conceptual Site Model**  
**Dump Site Near Bldg. 293**  
**NCTAMSPAC, Oahu, Hawaii**





(1) Future conditions are assumed to be the same as current conditions for ecological receptors. No future scenarios are run.

**Figure 6**  
**Ecological Receptor Conceptual Site Model**  
**Dump Site Near Bldg. 293**  
**NCTAMSPAC, Oahu, Hawaii**



